$$\dot{n}_{\mathrm{exh}} = \left(x_{\mathrm{raw/exhdry}} - x_{\mathrm{int/exhdry}}\right) \cdot \left(1 - x_{\mathrm{H2Oexh}}\right) \cdot \dot{n}_{\mathrm{dexh}} + \dot{n}_{\mathrm{int}}$$

Eq. 1065.655-26

Example:

$\dot{n}_{int}$ = 7.930 mol/s
$x_{raw/exhdry}$ = 0.1544 mol/mol
$x_{int/exhdry}$ = 0.1451 mol/mol
$x_{H20/exh}$ = 32.46 mmol/mol = 0.03246 mol/mol
$\dot{n}_{dexh}$ = 49.02 mol/s
$\dot{n}_{exh}$ = (0.1544 − 0.1451) · (1 − 0.03246) · 49.02 + 7.930 = 0.4411 + 7.930 = 8.371 mol/s

[73 FR 37331, June 30, 2008, as amended at 73 FR 59334, Oct. 8, 2008; 75 FR 23051, Apr. 30, 2010; 76 FR 57458, Sept. 15, 2011; 79 FR 23799, Apr. 28, 2014]

§ 1065.659 Removed water correction.

(a) If you remove water upstream of a concentration measurement, x, correct for the removed water. Perform this correction based on the amount of water at the concentration measurement, $x_{H2O[emission]meas}$, and at the flow meter, x_{H2Oexh}, whose flow is used to determine the mass emission rate or total mass over a test interval. For continuous analyzers downstream of a sample dryer for transient and ramped-modal cycles, you must apply this correction on a continuous basis over the test interval, even if you use one of the options in § 1065.145(e)(2) that results in a constant value for $x_{H2O[emission]meas}$ because x_{H2Oexh} varies over the test interval. For batch analyzers, determine the flow-weighted average based on the continuous x_{H2Oexh} values determined as described in paragraph (c) of this section. For batch analyzers, you may determine the flow-weighted average x_{H2Oexh} based on a single value of x_{H2Oexh} determined as described in paragraphs (c)(2) and (3) of this section, using flow-weighted average or batch concentration inputs.

(b) Determine the amount of water remaining downstream of a sample dryer and at the concentration measurement using one of the methods described in § 1065.145(e)(2). If you use a sample dryer upstream of an analyzer and if the calculated amount of water remaining downstream of the sample dryer and at the concentration measurement, $x_{H2O[emission]meas}$, is higher than the amount of water at the flow meter, x_{H2Oexh}, set $x_{H2O[emission]meas}$ equal to x_{H2Oexh}. If you use a sample dryer upstream of storage media, you must be able to demonstrate that the sample dryer is removing water continuously (*i.e.*, x_{H2Oexh} is higher than $x_{H2O[emission]meas}$ throughout the test interval).

(c) For a concentration measurement where you did not remove water, you may set $x_{H2O[emission]meas}$ equal to x_{H2Oexh}. You may determine the amount of water at the flow meter, x_{H2Oexh}, using any of the following methods:

(1) Measure the dewpoint and absolute pressure and calculate the amount of water as described in § 1065.645.

(2) If the measurement comes from raw exhaust, you may determine the amount of water based on intake-air humidity, plus a chemical balance of fuel, intake air, and exhaust as described in § 1065.655.

(3) If the measurement comes from diluted exhaust, you may determine the amount of water based on intake-air humidity, dilution air humidity, and a chemical balance of fuel, intake air, and exhaust as described in § 1065.655.

(d) Perform a removed water correction to the concentration measurement using the following equation:

$$x = x_{\text{[emission]meas}} \cdot \left(\frac{1 - x_{\text{H2Oexh}}}{1 - x_{\text{H2O[emission]meas}}} \right)$$

Eq. 1065.659-1

Example:

$x_{\text{COmeas}} = 29.0$ µmol/mol

$x_{\text{H2OCOmeas}} = 8.601$ mmol/mol $= 0.008601$ mol/mol

$x_{\text{H2Oexh}} = 34.04$ mmol/mol $= 0.03404$ mol/mol

$$x_{\text{CO}} = 29.0 \cdot \left(\frac{1 - 0.03404}{1 - 0.008601} \right)$$

$x_{\text{CO}} = 28.3$ µmol/mol

[73 FR 37335, June 30, 2008, as amended at 76 FR 57462, Sept. 15, 2011; 79 FR 23804, Apr. 28,2014]

§ 1065.660 THC, NMHC, and CH_4 determination.

(a) *THC determination and initial THC/CH_4 contamination corrections.* (1) If we require you to determine THC emissions, calculate $x_{\text{THC[THC-FID]cor}}$ using the initial THC contamination concentration $x_{\text{THC[THC-FID]init}}$ from § 1065.520 as follows:

$$x_{\text{THC[THC-FID]cor}} = x_{\text{THC[THC-FID]uncor}} - x_{\text{THC[THC-FID]init}}$$

Eq. 1065.660-1

Example:

$x_{\text{THCuncor}} = 150.3$ µmol/mol

$x_{\text{THCinit}} = 1.1$ µmol/mol

$x_{\text{THCcor}} = 150.3—1.1$

$x_{\text{THCcor}} = 149.2$ µmol/mol

(2) For the NMHC determination described in paragraph (b) of this section, correct $x_{\text{THC[THC-FID]}}$ for initial THC contamination using Equation 1065.660–1. You may correct $x_{\text{THC[NMC-FID]}}$ for initial contamination of the CH_4 sample train using Equation 1065.660–1, substituting in CH_4 concentrations for THC.

(3) For the CH_4 determination described in paragraph (c) of this section, you may correct $x_{\text{THC[NMC-FID]}}$ for initial THC contamination of the CH_4 sample train using Equation 1065.660–1, substituting in CH_4 concentrations for THC.

(b) *NMHC determination.* Use one of the following to determine NMHC concentration, x_{NMHC}: